

New Distribution and Biological Records for Native Dung Beetles, in the Tribe Scarabaeini, from Northern New South Wales

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New coastal and inland distribution records, and behavioural observations, are given for Scarabaeini dung beetles collected from northern New South Wales.

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INTRODUCTION

Northern New South Wales is a centre of diversity for dung beetles in the tribe Scarabaeini (Matthews 1974). Numerous species are restricted to wet forest types along the Great Dividing Range (Williams 2002), but the maritime fauna, and that of isolated forest outliers east and west of the main mountain range complex, has been poorly documented.

This paper gives additional scarabaeine distribution and behavioural records. Unless otherwise stated all beetles were collected at excrement-baited pit-fall traps. Voucher specimens have been deposited in the Queensland Department of Primary Industries Collection, Mareeba, Lorien Wildlife Refuge field reference collection, Lansdowne, and the Australian Museum, Sydney.

NEW RECORDS

Amphistomus speculifer Matthews

New western distribution record

Cedar Brush Nature Reserve, Liverpool Range, NW of Scone, 12-13.ii.1999, G. Williams, subtropical rainforest.

Aptenocanthon hopsoni (Carter)

New northern and eastern distribution records

Dooragan National Park, North Brother Mtn (~480 m.a.s.l.), Laurieton, 30.xii.1998, G. Williams,

subtropical rainforest; same locality except, 25-27.xi.1999, G. and T. Williams; Hueys Corner, Fitzroy Creek, Carrai State Forest, WNW of Kempsey, 8-9.ii.1997, G. and B. Williams, warm temperate rainforest; Banda Banda Beech Reserve, NW of Wauchope, 10-11.i.1984, G. Williams and C. Cross, cool temperate rainforest; Cockerawombeeba Flora Reserve, NW of Wauchope, 14-15.i.1988, G. and B. Williams, rainforest; Wilson River Flora Reserve, NW of Wauchope, 5-6.xii.1988, G. Williams, subtropical rainforest; vicinity Mt Seaview-Oxley Highway turnoff, W of Wauchope, 28-29.xii.1988, G. Williams, warm temperate rainforest.

Aulacopris maximus Matthews

New eastern distribution and behaviour records

Approximately 4.5 km N of Lansdowne, Coorabakh National Park, 19.i.1996, G. and B. Williams, in bat cave, at bat guano; Dooragan National Park, North Brother Mtn (~480 m.a.s.l.), Laurieton, 30.xii.1998, G. Williams, subtropical rainforest; Banda Banda Beech Reserve, NW of Wauchope, 28.i.1985, G. Williams, perching at night on tree trunk (~4m above ground), warm temperate rainforest; 'The Pines', Way Way State Forest, SW of Scotts Head, 20-21.i.1999, G. and T. Williams, subtropical rainforest.

Diorygopyx asciculifer Matthews

New northern and western distribution, and habitat records

Cedar Brush Nature Reserve, Liverpool Range, NW of Scone, 12-13.ii.1999, G. Williams, dry

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sclerophyll forest, at macropod dung; Camden Head, 25-27.xi.1999, G. and T. Williams, littoral rainforest; Lake Cathie, 26.ii.1999, G. and T. Williams, vine thicket.

Diorygopyx incomptus Matthews

New southern distribution, and habitat records

Glenugie Peak, Glenugie State Forest, SE of Grafton, 16.xii.1998, G. and B. Williams, dry rainforest - vine thicket complex.

Diorygopyx incrassatus Matthews

New northern and eastern distribution, habitat and behaviour records

Dooragan National Park, North Brother Mtn (~480 m.a.s.l.), Laurieton, 30.xii.1998, G. Williams, subtropical rainforest; same locality except, 25-27.xi.1999, G. and T. Williams; Sea Acres Nature Reserve, Port Macquarie, 25-27.xi.1999, G. and T. Williams, subtropical rainforest; Wilson River Flora Reserve, NW of Wauchope, 5-6.xii.1988, G. Williams, subtropical rainforest, perching at night on low foliage; Cockerawombeeba Flora Reserve, NW of Wauchope, 14-15.i.1988, G. and B. Williams, rainforest; same locality except, 25-27.xi.1999, G. and T. Williams; Racecourse Headland, S of Crescent Head, 20.i.1999, G. and T. Williams, littoral rainforest; vicinity 'The Blowhole' Boonanghi State Forest, 24 km W of Kempsey, 8.x.1993, G. Williams, riparian dry rainforest; 'The Pines', Way Way State Forest, SW of Scotts Head, 20-21.i.1999, G. and T. Williams, subtropical rainforest.

Diorygopyx niger Matthews

New southern distribution and behaviour records

Mt Killiekrankie, New England National Park, 12.i.2001, G. and B. Williams, wet sclerophyll forest, at bird carrion; Coachwood Creek, vicinity of 'Kookaburra', Carrai State Forest, WNW of Kempsey, 8-9.ii.1997, G. and B. Williams, wet sclerophyll forest - warm temperate rainforest complex; vicinity 'The Natural Arch', Carrai State Forest, WNW of Kempsey, 8-9.ii.1997, G. and B. Williams, wet sclerophyll forest.

DISCUSSION

Species of the flightless endemic genus *Diorygopyx* exhibit restricted distribution patterns along the New South Wales north coast (Matthews 1974). *Diorygopyx incrassatus* was previously recorded from the Hastings Valley and the northern

rim of the Manning Valley (Matthews 1974, Williams and Williams 1983b). It is replaced to the immediate north by *D. niger* and to the south by *D. asciculifer* (Matthews 1974). In the Carrai Plateau region, west of Kempsey, *D. niger* occurs at higher elevations (e.g., < 1000 m.a.s.l.) and *D. incrassatus* is found in submontane forest (ie. Boonanghi State Forest). The maritime distribution of *D. incrassatus*, however, is skewed northwards into latitudes occupied by *D. niger* and reaches to at least Way Way State Forest, near Macksville. The maritime distribution of *Diorygopyx asciculifer* is similarly skewed northwards. In littoral rainforest south of Port Macquarie *D. incrassatus* is displaced by *D. asciculifer* (Williams 1979, Williams and Williams 1984). At Laurieton *D. incrassatus* occurs in mountainous (~480 m.a.s.l.) subtropical rainforest of Dooragan National Park approximately 3 kilometres inland from the coastline, but *D. asciculifer* occurs in adjacent littoral rainforest remnants at Camden Head, Lake Cathie and Crowdy Bay National Park, to the east, north, and south respectively.

Diorygopyx asciculifer is the southern-most member of the genus, and is widely distributed in rainforests of the Manning catchment (Matthews 1974, Williams and Williams 1983a). In addition, it penetrates to the isolated Liverpool Ranges, west of Barrington Tops, where it has been collected in dry sclerophyll forest. At least one further species of *Diorygopyx*, *D. duplodentatus* Matthews, originally recorded only from rainforest, also occurs in drier forest types at the western extremity of its known range (C. Reid pers. comm.).

Diorygopyx incomptus was originally described from the Macpherson Ranges (Matthews 1974) but is more widely distributed in rainforests of far northern New South Wales (Williams 2002). It was collected in large numbers in low dry rainforest and associated vine thickets on scree slopes at Glenugie Peak, southeast of Grafton. This is a small area of isolated rainforest occurring within an extensive landscape matrix of dry forest and woodland.

Matthews (1974) cited two specimens of *D. niger* found under old wallaby bones (an association which he considered possibly fortuitous). Numerous adult *D. niger* were collected in and under bird carrion at Mt Killiekrankie in January 2001 possibly confirming necrophagous habits in the species.

The genus *Aptenocanthon* comprises two species from New South Wales (*A. hopsoni*, *A. rossi* Matthews) and a further six species from northern Queensland (Storey 1984, Storey and Monteith 2000). *Aptenocanthon rossi* is known only from the Mt Wilson-Mt Irvine area west of Sydney (Matthews

1974, Williams and Williams 1982) and *A. hopsoni* was previously recorded from montane wet forests in Barrington Tops, Dingo Tops and the Comboyne Plateau (Matthews 1974, Williams and Williams 1983a). However, the distribution of *A. hopsoni* reaches montane rainforests in the Carrai Plateau, and its near-maritime occurrence in submontane rainforest at Dooragan National Park is exceptional.

Aulacopris maximus was recorded by Waite (1898) from the Yessabah bat caves, in the Macleay Valley, northern New South Wales. Fricke (1964) recorded the related southern species *A. reichei* White "densely populating" a small cave sheltering bandicoots in a suburban garden at Mosman, Sydney. *Aulacopris maximus* is possibly a specialist on bat guano (G. Monteith pers. comm.). However, no further records of association with bat caves have been published. *Aulacopris maximus* was collected on a guano heap in a small cave in Coorabakh National Park (formerly part Lansdowne State Forest), near Taree, in January 1996. This is a roost cave seasonally occupied by *Miniopterus* spp., and dissected by an intermittent stream. Bat guano deposits are regularly flushed from the cave during heavy rain, which presumably would limit occupation of the cave and utilisation of guano deposits by invertebrate fauna.

Scarabaeine dung beetles have been recorded from the Americas, and tropical Australia, perching near the ground on plant leaves (Howden, Howden and Storey 1991, Howden and Nealis 1978, Young 1982). This may be a predator avoidance strategy (Young 1982) or related directly to foraging (Howden *et al.* 1991). Howden *et al.* (1991) record the dung beetle genera *Monoplistes*, *Temnoplectron* (Scarabaeini) and *Onthophagus* (Onthophagini) perching on foliage in tropical Queensland rainforest, but no other Australian records are known. Two subtropical species, *Diorygopyx incrassatus* and *Aulacopris maximus*, were observed nocturnally perching in montane rainforests of the Upper Hastings Valley; several *D. incrassatus* on low foliage in subtropical rainforest, and a single *A. maximus* approximately 4 m above ground on a tree trunk in warm temperate rainforest. *Aulacopris maximus* has previously been collected from inside possum nest boxes placed on tree trunks (Williams 1993). The large numbers of some species recorded by Howden *et al.* (1991) from tropical Queensland suggested 'perching' may be a common, albeit localised, strategy. There are no similar abundance records for Australian subtropical dung beetles, and extensive spot-lighting in New South Wales north coast rainforests indicates that perching may be rare.

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